[002] This application is a National Stage completion of PCT/CH2003/000839 filed December 22, 2003 which claim priority from Swiss application serial no. 2211/02 filed December 24, 2002.

< [016] This goal is achieved by the method of the invention ~~as defined in the~~
< ~~preamble~~ and characterized in that a first heat-transmitting fluid is circulated in a first circuit, called the hot circuit, connected to a first compartment of an enclosure containing a rotating element and a second heat-transmitting fluid in a second circuit, called the cold circuit, connected to a second compartment of said enclosure, said compartments being juxtaposed and separated by a partition, said enclosure being associated with a magnetic means to generate a magnetic field in said first compartment, at least in the area corresponding to said rotating element, and said rotating element comprising at least one magneto-calorific material which undergoes a temperature increase when it passes through said first compartment subjected to the magnetic field, and cools down when it passes through said second compartment that is not subjected to the magnetic field, in that heat is extracted from said first circuit using a first heat exchanger located in said circuit and connected to a heat utility circuit, and in that cold is extracted from said second circuit using a second heat exchanger located in said circuit and connected to a cold utility circuit.

< [030] In [[the]] a preferred ~~form of~~ embodiment, the first circuit comprises a first pump and the second circuit comprises a second pump, the purpose of said

pumps being to circulate the first and second heat-transmitting fluids, respectively, through each of these compartments.

1-23. (CANCELED)

24. (NEW) A method for generating cold and heat by a magnetic effect through at least one heat exchanger, a first heat-transmitting fluid circulates through a first hot circuit (17a) connected to a first compartment (12) in an enclosure (11) containing a rotating element (15), and a second heat-transmitting fluid circulates in a second cold circuit (17b) connected to a second compartment (13) in the enclosure (11), the first and second compartments being juxtaposed and separated by a partition (14), the enclosure (11) being associated with magnetic elements (16) for generating a magnetic field in the first compartment (12), at least in an area corresponding to the rotating element (15), and the rotating element (15) comprising at least one magneto-calorific material which undergoes a temperature increase when the at least one magneto-calorific material passes through the first compartment (12) subjected to the magnetic field and cools when the at least one magneto-calorific material passes through the second compartment (13) that is not subjected to the magnetic field, heat is extracted from the first hot circuit (17a) using a first heat exchanger (18) located in the first hot circuit (17a), the first exchanger (18) being connected to a heat utility circuit (19), cold is extracted from the second cold circuit (17b) using a second heat exchanger (21) located in the second cold circuit (17b), and the second exchanger being connected to a cold utility circuit (21).

25. (NEW) The method according to claim 24 further comprising the step of circulating the first and second heat-transmitting fluids through the first and second compartments (12, 13) in the enclosure (11).

26. (NEW) The method according to claim 25 further comprising the step of using a fluid in one of a liquid and a state as the first and second heat-transmitting fluids.

27. (NEW) The method according to claim 24 further comprising the step of reversing the position of the magnetic elements (16) relative to the first and second compartments (12, 13) in the enclosure to arbitrarily generate cold and heat in one of the first and second compartments.

28. (NEW) The device for generating cold and heat by a magneto-calorific effect, wherein the device comprises:

an enclosure (11) divided into first and second compartments (12, 13) that are juxtaposed and separated by a partition (14), the enclosure (11) containing a rotating element (15) that is transverse in relation to the first and second compartments (12, 13) and rotating on an axle located in a plane of the partition (14) so that the rotating element (15) is simultaneously partially inside the first and second compartments (12, 13);

a first hot circuit (17a) connected to the first compartment (12) of the enclosure (11) and comprising a first heat exchanger (18) through which a first heat-transmitting fluid circulates, and the first exchanger being connected to a heat utility circuit (19);

a second cold circuit (17b) connected to the second compartment (13) of the enclosure (11) and comprising a second heat exchanger (21) through which a second heat-transmitting fluid circulates, and the second exchanger being connected to a cold utility circuit (22); and

magnetic elements (16) for generating a magnetic field in the first compartment (12), at least in the area corresponding to the rotating element (15), the rotating element (15) comprising at least one magneto-calorific material which undergoes a temperature increase when the rotating element (15) passes through the first compartment (12) subjected to the magnetic field and cools down when the rotating

element (15) passes through the second compartment (13) that is not subjected to the magnetic field.

29. (NEW) The device according to claim 28 wherein the magnetic elements (16) comprise permanent magnets.

30. (NEW) The device according to claim 28 wherein the magnetic elements (16) comprise electromagnets.

31. (NEW) The device according to claim 28 wherein the magnetic elements (16) generate a variable magnetic field.

32. (NEW) The device according to claim 28 wherein the device comprises complementary magnetic elements (16a) to create an insulating magnetic field insulating the second compartment (13) from the magnetic field generated by the magnetic elements (16).

33. (NEW) The device according to claim 28 wherein the magnetic elements (16) are movable so the magnetic elements (16) can be located either in a first position (P1) where the magnetic elements (16) generate a magnetic field in one of the first and second compartments (12, 13) or in a second position (P2) where the magnetic elements (16) generate a magnetic field in the other of the first and second compartments (12, 13).

34. (NEW) The device according to claim 30 wherein the magnetic elements (16) comprise first electromagnets for creating a magnetic field in the first compartment (12), second electromagnets for creating a magnetic field in the second compartment (13) and control means for respectively actuating the first or the second electromagnets.

35. (NEW) The device according to claim 28 wherein the first and second heat exchangers (18, 21) are selected from the group consisting of liquid to liquid, liquid to gas, and gas to gas heat exchangers.

36. (NEW) The device according to claim 28 wherein the first hot circuit (17a) comprises a first pump (19), the second cold circuit (17b) comprises a second pump (22) and the first and second pumps make the first and the second heat-transmitting fluids circulate respectively through each of the first and second compartments (12, 13).

37. (NEW) The device according to claim 28 wherein the rotating element (15) comprises a system of traversing passageways (25), and the traversing passageways (25) allows the first and second heat-transmitting fluids to circulate inside the rotating element.

38. (NEW) The device according to claim 37 wherein the rotating element (15) comprises a unit of stacked discs (30) made of different magneto-calorific materials, each disc comprising a system of traversing passageways (25) communicating with the traversing passageways (25) in the adjacent disc or discs.

39. (NEW) The device according to claim 37 wherein the rotating element (15) comprises a system of hollow overlapping cylindrical elements (40) made of different magneto-calorific materials, each cylindrical element (40) comprising a system of traversing passageways (25).

40. (NEW) The device according to claim 37 wherein the rotating element (15) comprises a system of nested angular sectors (50) made of different magneto-calorific materials, and the angular sectors (50) being insulated from one another by thermally insulating elements (26), and each angular sector comprising a system of traversing passageways (25).

41. (NEW) The device according to claim 37 wherein the rotating element (15) comprises a single cylindrical element made of magneto-calorific material, the cylindrical element comprising a system of traversing passageways (25) opening onto two surfaces.

42. (NEW) The device according to claim 37 wherein the rotating element (15) comprises walled angular sectors (60) containing generally spherical grains (27) consisting of at least one magneto-calorific material, and the traversing passageways (25) are defined by interstices formed between the grains (27).

43 (NEW) The device according to claim 37 wherein the traversing passageways (25) are formed of an alveolar structure.

44. (NEW) The device according to claim 37 wherein the traversing passageways (25) are formed as hollow tubes disposed along the axle of the rotating element (15).

45. (NEW) The device according to claim 37 wherein the traversing passageways (25) are formed as a porous structure.

46. (NEW) A method of generating cold and heat by magneto-calorific effect through at least one heat exchanger, a first heat-transmitting fluid is circulated through a first hot circuit (17a) connected to a first compartment (12) in an enclosure (11) containing a rotating element (15) and a second heat-transmitting fluid through a second cold circuit (17b) connected to a second compartment (13) of the enclosure (11), the first and second

compartments being juxtaposed and separated by a partition (14), the enclosure (11) being associated with magnetic elements (16) for generating a magnetic field in the first compartment (12), at least in the area corresponding to the rotating element (15), and the rotating element (15) comprising at least one superconductive material which undergoes a temperature increase when the at least one superconductive material passes through the first compartment (12) subjected to the magnetic field and cools down when the at least one superconductive material passes through the second compartment (13) that is not subjected to the magnetic field, heat being extracted from

the first hot circuit (17a) using a first heat exchanger (18) located on the first hot circuit (17a), the first exchanger being connected to a heat utility circuit (19), and cold is extracted from the second cold circuit (17b) using a second heat exchanger (21) located on the second cold circuit (17b), and the second exchanger being connected to a cold utility circuit (21).